ABSTRACT

An electromagnetic wave generator encompasses a first pump beam emitter (2) configured to emit a first pump beam (hv$_1$) having a wavelength larger than one micrometer; a second pump beam emitter (25) configured to emit a wavelength-tunable second pump beam (hv$_2$) having a wavelength larger than one micrometer, the wavelength of which is different from the wavelength of the first pump beam (hv$_1$); a nonlinear optical crystal (19) configured to generate an electromagnetic wave (hv$_3$) of a difference frequency between the first pump beam (hv$_1$) and second pump beam (hv$_2$) ; and an optical system (M$_1$, M$_2$, 18) configured to irradiate the first pump beam (hv$_1$) and second pump beam (hv$_2$) to the nonlinear optical crystal (19), by adjusting an external intersection angle between the first pump beam (hv$_1$) and second pump beam (hv$_2$) within 0.5° at the difference frequency of 1 THz.   Here, a frequency-tunable terahertz electromagnetic wave (hv$_3$) is generated in the nonlinear optical crystal (19), by changing the frequency of the second pump beam (hv$_2$), being liked with the change of the external intersection angle.